I. C. 6507

SEPTEMBER, 1931

DEPARTMENT OF COMMERCE

UNITED STATES BUREAU OF MINES
SCOTT TURNER, DIRECTOR

INFORMATION CIRCULAR

SAFETY INSPECTIONS IN AND AROUND IRON MINES IN THE LAKE SUPERIOR DISTRICT

RECEIVED
OCT 15 1931
O. S. U. LIBRARY

BY

F. S. CRAWFORD

Digitized by Google

I.C.6507.
September, 1931

INFORMATION CIRCULAR

DEPARTMENT OF COMMERCE - BUREAU OF MINES

SAFETY INSPECTIONS IN AND AROUND IRON MINES IN THE LAKE SUPERIOR DISTRICT[1]

By F. S. Crawford[2]

During the course of a study of the safety organizations of the various iron mining companies in the Lake Superior district considerable information regarding the methods of safety inspection in use was obtained which may be of value to other companies beginning safety work or contemplating changes in their methods.

A short description of the safety-inspection methods of eleven of these companies is given in this paper, and in the appendix are illustrated a number of forms used for safety inspections by several of the companies. Most of the companies whose methods are described use few forms for formal inspection. The one long form (10) attached which is used for a general inspection by the safety inspector appears to present a good method for enabling the inspector to check all branches of his inspection and to assure himself that everything has been covered.

All names of companies have been deleted from this paper and from the forms because the object is to disseminate information of constructive value rather than to point out the methods of particular companies by name.

SAFETY-INSPECTION METHODS

Company 1

Besides the regular inspections by the safety engineer, every supervisory official is charged with the safety inspections for all dangerous conditions which may come under his observation. This includes inspections by the mining captain, shift bosses, master mechanic, blacksmith, foremen, electrician, head pipeman, and surface bosses.

---

1 The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6507."

2 District engineer, U. S. Bureau of Mines Safety Station, Duluth, Minn.

Digitized by Google

Kinds of Inspections.- The Safety Engineer makes inspections underground for loose ground, badly placed timber, nails in timber or planks, headboards, ladder roads, covering of raises, staging, blasting lines, explosives, fuse, caps, "powder" houses, chute guards, trolley guards, safety zones, block-signal system, fire hazards, and cleanliness. On the surface he inspects for fire hazards, machinery guards, tracks, change houses, engine house, shops, test pits, and abandoned shafts, trestles, shaft houses, pulley stands, timber yards, and cleanliness.

The master mechanic, blacksmith foreman, electrician, head pipeman, and surface foreman make inspections of the equipment under their charge.

Frequency of Inspections.- Daily inspections are made by the captains and shift bosses. Weekly inspections are made by the safety engineer. Monthly inspections of blasting lines and fire extinguishers are made by the electrician. Bimonthly inspections of test pits and abandoned shafts are made by the safety engineer.

Following is a list of reports (forms 13 to 19 of which are appended to this report) customarily made out by the safety engineer and the chief electrician:

(13) Safety Report on Cages,
(14) Weekly Report of Lilly Hoist Controllers,
(15) Daily-Weekly Report on Skips, Cages, and Hoisting Cables,
(16) Weekly Report on Blasting Lines and Control,
(17) Method of Handling Timber at ----- Mine,
(18) Report on Safety Belts,
(19) Fire Extinguisher Inspection Report.

Company 2

Company 2 is small, and safety inspections are made by a representative committee from the foremen's conference and the works council. This is also part of the safety inspector's duties. There is no regular form of report, but the committee as a whole reports on matters which the members feel should have consideration.

Company 3

Company 3 is small and has no definite safety inspection, aside from that which is done by the shift bosses and mine foreman in their regular rounds. Other inspections are made by the county mine inspector, the State boiler inspector, and the State fire inspector; the latter two make annual visits, and the county mine inspector visits the operations approximately weekly.

Digitized by Google

Company 4

Company 4 has been comparatively small until recently, when their operations have expanded, and a safety engineer has been employed. The safety engineer makes daily inspections of all the plants operated by the company, and reports to the general superintendent by letter. No form for inspection reports has been used up to the present time.

Company 5

Company 5 works a small mine with three shafts. Two workmen spend one-half day on the safety inspection of each mine every three weeks just before the general safety meeting. They may be miners, trammers, timbermen, or other classes of workmen. The inspection is entirely informal, no report form being supplied for this purpose, and the report may be in the form of notes, or may even be verbal.

Company 6

Safety inspections are made by the range safety inspector, the underground safety inspector, the mining captains at each mine, the superintendents, assistant general superintendent, the general superintendent, and by every official.

These inspections are made every day. No formal report form is used, but a recommendation slip is handed to the mine superintendent and the foreman responsible. These recommendation slips are numbered and followed up very closely, one slip being made out for each item in question. They are carried as "unfinished" until they are completed to the satisfaction of the inspector. A report form is used only for the hoist inspection and the monthly summary of safety inspections.

Company 7

Company 7 is a comparatively large organization. The safety engineer inspects all properties regularly and continuously, taking three weeks to make the round of Michigan and Minnesota properties. Inspection is made of the surface and underground, in which particular attention is paid to the condition of guards for machinery, loose material, safe and unsafe practices, to seeing that safety regulations are being followed, that the hoisting cable is regularly inspected, that safety catches on the cages are tested every month, inspections are made for fire hazards, and to seeing that more than one exit is in good condition and that necessary precautions are taken to protect the workman.

A safety committee of workmen inspects each property each month, and makes a report at the general safety meeting. No special report forms are used. A weekly report by the safety engineer is sent to the general manager, assistant general manager, general superintendent, the claims manager, and the main office of the company.

Digitized by Google

Company 8

In another well-established organization, safety inspections of all properties and in every working place are made by the safety inspector and by committees of foremen and workmen. Some inspections are monthly, others quarterly, and others are annual.

Reproductions (1 to 10) of report forms are appended, and include the following:

(1) Cage Rider's Report - daily,
(2) Report of Inspection and Fire Equipment - quarterly,
(3) Report of Testing Cage Safety Catches - monthly,
(4) Report of Inspection of Skip and Cage Roads - weekly,
(5) Report of Inspection of Ladder Ways and Shaft Stations - weekly,
(6) Report of Testing Fire Doors - monthly,
(7) Report of Mine Rescue Apparatus - monthly,
(8) Report of Training with Mine Rescue Apparatus - monthly,
(9) Electrical Department Inspection Report of Equipment - quarterly,
(10) Mine Safety Inspection Report - monthly.

During 1929, there were 8,198 of these separate reports turned in to the safety department. The assistant to the safety inspector, who spends the major portion of his time training men in mine rescue and first aid, also spends part of his time checking these reports. He checks mainly as to recommendations which have been made. Since these reports go first to the superintendent of the mine, it is his duty to correct any difficulty at once. If the same difficulty is reported several times without action having been taken, it is a duty of the safety department to follow up the matter and see that the dangerous condition is corrected.

Company 9

Besides the inspection by the safety engineer, there are inspections by men in each department, such as the machinery mechanic, the head machinist, the mine electrician, the timber foreman, mining captain, shift bosses, and superintendents. There is also a periodical safety inspection at each mine by a committee of three, including a safety engineer, a superintendent, and the head mechanic from a mine in a different district. This committee is selected by the general manager for each inspection, which may take place semi-annually and sometimes more frequently, depending upon how much the mines are operating, but not made at any definite time. The superintendent and mechanic on the committee for an inspection of Michigan or Wisconsin mines of the company are selected from Minnesota, and conversely for inspection of Minnesota mines.

Digitized by Google

Inspections are made of the condition of wire rope and its fastenings; the condition of ore skips, man cages and fastenings, safety devices, such as cage safety dogs and guides, idler sheaves, pulleys, hoists, signal systems, bell codes, mine telephones; fire-fighting equipment; mine-rescue equipment; sanitation; boilers; electrical equipment; pumps; electric switches; shafts; manways including escapement shafts, raises, drifts; timbering; powder storage and handling; motor haulage; blasting; first-aid supplies; lighting; buildings and other structures; fencing footpaths, and other equipment.

Where conditions are continually changing, such as on equipment which is used for transporting the men into and from the mine, inspections are made every day. Other inspections are made weekly and monthly. A form of report is provided for inspection tests on such mechanical equipment as hoisting rope, hoists, rope fastenings, sheaves, idlers, skips, man cages, fire-fighting equipment, signal systems, telephones, handling of explosives, and a report of the cage rider. This form is used monthly, although the inspection is made every day. The results of the other inspections are also reported monthly. Accident reports are made through a shift boss's report, report of the mine office, the doctor's report, the safety engineer's report, the State industrial commission report, and the report of investigation of the mine accident committee which consists of a mine captain, safety engineer, and an electrician or other mechanic selected by the superintendent, according to the nature of the accident and who function only in case of serious injury. The watchman also makes a daily report of safety conditions, and a form is provided for the report of the periodical safety inspection committee previously mentioned.

Company 10

Safety inspections are made by the safety engineer, assistant safety engineer, mining captains, shift bosses, old employees and new employees. Underground inspections relative to safety and cleanliness are made by the assistant safety engineer or the safety engineer once every month. All new employees act as safety inspectors for one day before going on their regular work; in this way all men underground will have acted as safety inspectors at some time.

Surface inspections relative to cleanliness are made by the engineer or assistant engineer every three months. Surface openings, such as test pits and shafts, are inspected once every month. All surface openings are covered where possible and fenced off. All fences and signs are inspected regularly every month, and a report is forwarded to all properties operated by the same company.

Four separate and distinct forms of safety inspections are made.

First: The foreman at the end of each shift makes out a safety and cleanliness report on every working place under his jurisdiction. The contents of this report are observed by the foreman on the opposite shift when he reports for duty, and the report is countersigned by him.

Digitized by Google

Second: The safety engineer submits to the safety committee a monthly inspection report covering every working place on the property, both on the surface and underground.

Third: New underground employees are assigned the duties of underground safety inspectors for the first day of their employment. They are accompanied through the mine either by the foreman or the mining captain and are required to make a written report covering their version of the safety conditions of the mine.

Fourth: Periodically, men are selected at random from the underground forces to act as safety inspectors. They are required to make a written report of their findings. This results in keeping the men always alert to dangers and has gradually instilled the safety idea into the entire crew.

No regular form is used for underground or surface inspections. The inspector writes up a report which is read and discussed at the safety meetings. The shift bosses make out a daily report (20) on safety and cleanliness underground which is read and discussed each morning at the mine.

Company 11

Safety inspections are made by the assistant safety engineers and the safety inspectors. Their inspection covers the condition and placing of guards and equipment, the cleanliness and sanitation of all openings in the mine, observation of the working habits of workmen, the handling of explosives, and other material. These inspections are made every day. The inspectors report verbally to the foreman as well as making a written report upon what they have found. A copy of this report goes to the foremen's committee, but no particular form of report is used for making this inspection. A daily rope inspection is made, results being entered upon the weekly head pipeman's report (11), which is sent to the master mechanic every Monday. This includes a daily inspection of the cage and safety "dogs," skips, sheaves, and counterweights. A drop test of the hoisting rope is made every month. Another report which is a statement of tests of each hoist made every day, and includes a test of the hoist controls, signals, brakes and controllers, is submitted monthly by the hoist inspector to the master mechanic's office on a form (12).

Digitized by Google

APPENDIX

(1) Cage Rider's Daily Report.
(2) Report of Inspection of Fire Equipment.
(3) Monthly Report of Testing Cage Safety Catches.
(4) Report of Inspection of Skip and Cage Roads.
(5) Weekly Report of Inspection of Ladder Ways and Shaft Stations.
(6) Monthly Report of Testing Fire Doors.
(7) Monthly Report of Mine-Rescue Apparatus.
(8) Monthly Report of Training with Mine-Rescue Apparatus.
(9) Quarterly Inspection Report - Electrical Department.
(10) Safety Inspection Report.
(11) Weekly Head Pipeman's Report.
(12) Hoist Inspector's Report.
(13) Safety Report on Cages.
(14) Weekly Report of Lilly Hoist Controllers.
(15) Daily-Weekly Report on Skips, Cages, and Hoisting Cables.
(16) Weekly Report on Blasting Lines and Control.
(17) Report Covering the Handling of Timber at the ----- Mine.
(18) Report on Safety Belts.
(19) Fire Extinguisher Inspection Report.
(20) Shift Bosses' Underground Safety Report.

Digitized by Google

1921 8-20 36426 S.P.Co. 1921

(806)

THE IRON CO.

MINING DEPARTMENT

Cage Rider's Daily Report _____ Mine

for _____ Shift _____ 19____

Day of Week Day of Month

Time on _____ Time off _____ Forenoon

Time on _____ Time off _____ Afternoon

1. Has anyone ridden on the cage without the cage rider?

2. Have the doors been shut when men are riding?

3. Is there to much crowding getting on and off the cage?

4. Have more men ridden on cage at any one time than the number designated by the superintendent?

5. Have any drills been carried to surface on the floor of cage with load of men?

6. At what hour was powder carried on cage into mine?

7. Have any men been carried on cage with powder?

8. Are signals in good condition?

9. Has the brakeman responded promptly and carefully to signals?

10. Remarks:

Noted:	
Mining Captain	Cage Rider

This report must be made out at end of shift.

Any violations of the above rules must be reported.

This report must be made in duplicate, one copy to be sent to the General Office and the other to the Captain to be kept on file at the Mine Office.

(1)

Digitized by Google

(914)

THE IRON COMPANY

MINING DEPARTMENT

REPORT OF INSPECTION OF FIRE EQUIPMENT

..... Mine

Made ..... 192.....

1. What is condition of hose? ..... feet good ..... feet poor
2. What pressure was used in test? .....
3. Is there a sufficient quantity of fire hose at mine? .....
   State number of feet .....
4. What is condition of hydrants? .....
5. Is the hydrant equipment ample? .....

Remarks: .....

.....

.....

.....

Inspector.

This report must be made out during the second week of January, April, July and October. (2)

818

THE IRON CO.

MINING DEPARTMENT

Monthly Report of Testing Cage Safety Catches _____ Mine

_____ 19____

[illegible]

1. When were safety catches tested? _____
2. Did they work satisfactorily? _____
3. Do they now work satisfactorily? _____
4. Who were present when catches were tested? _____
5. Are other safety-catches in working order? _____

_____

INSPECTOR.

NOTE—Safety-catches must be tested in the presence of cage inspector and the superintendent or the captain in the absence of superintendent. (3)

911

_____ 192__

THE IRON CO.

Report of Inspection of Skip and Cage Roads _____ Mine

[illegible]

	CONDITION	REPAIRS NEEDED	REMARKS
_____ Skip Road.	_____	_____	_____
_____ Skip Road.	_____	_____	_____
Cage Road.	_____	_____	_____
Detail of Repairs Needed	_____	_____	_____

_____

_____

Dated _____ 192__ Inspected by _____

_____

NOTE.—Inspection must be made at least once each week. (4)

Digitized by Google

(606)

The Iron Company

Weekly Report of Inspection of Ladder Ways and Shaft Stations

.....Mine.....19.....

SSL 10-08. W.P.Co. J 14076.

1. State condition of ladders.	
2. State condition of collars.	
3. State condition and location of any broken ladders, rungs or other dangerous places.	
4. State condition of shaft stations.	
5. Are entrances to shafts properly protected?	
6. Are lights at shaft stations in good condition?	
7. Are dangerusgns placed in ladderways above and below dangerous places until the same are repaired?	
8. REMARKS:	
Date	
Noted by	.....Inspector

The location and condition of any broken ladders or dangerous places in the ladderways must be reported at once to the Captain and the Inspector must make such temporary repairs as will leave things safe until regular repairs can be made. If such repairs cannot be made at once a danger sign shall be placed at entrance to ladderway and another at the bottom until repairs are made.

It shall be the duty of the Inspector to inspect all ladders and ladderways which are used as traveling roads, including the second outlet, once each week. It shall be his duty to report all changes or repairs which he has made and others which may be necessary. The entire mine is to be covered at one continuous inspection.

This report is to be made out in duplicate, one copy to be sent to General Office, the other to go to the Captain and be on file in the Mine Office. These reports are to go to the Captain and to the General Office on Monday of each week.

(5)

(625)

THE IRON CO.

MINING DEPARTMENT

Monthly Report of Testing Fire Doors_____ **Mine**

_____ 193____

IM-9-09 I.O. K2849

1. Date when doors were tested? _____
2. Were all doors tested? _____
3. Did they work satisfactorily? _____
4. If not, what were the causes for failure? _____

_____

_____

5. Are all doors in good condition? _____
6. Is the connecting air line in good condition? _____

_____ INSPECTOR

NOTE—This report is to be made out in duplicate; one copy to be kept on file in the Mine Office and the other to be sent to the General Office.

(6)

Digitized by Google

The Iron Company

MINING DEPARTMENT (SAFETY)

Monthly Report of Mine Rescue Apparatus **Station No._____**

_____, Mich., _____ 192

HELMETS: Nos.						
Tubes and Connections						
Other Leather Parts						
Other Metal Parts						
BACK APPARATUS: Nos.						
Tubes and Connections						
Reducing Valves						
Breathing Bags						
Other Leather Parts						
OXYGEN STORAGE TANKS: Nos.						
Atmospheres						
ELECTRIC LAMPS: Nos.						
Date Battery Last Charged						
General Condition						
PUMP. Nos.						
State General Condition						
PULMOTOR: Nos.						
State General Condition						

Number of Fresh Potash Cartridges on hand.....1 Hour .....2 Hour .....

Number of Extra Oxygen Cylinders on hand (filled) .....

REMARKS: .....

.....

.....

..... Foreman

(7)

Digitized by Google

905

The Iron Company

MINING DEPARTMENT (Safety)

Monthly Report of Training with Mine Rescue Apparatus. **Station No._____**

_____, Mich., _____ 19

TRAINING RECORD:

Name*	Mine	Date	Duration	Detail of Training	Condition of Wearer after Practice

REMARKS: _____

*Men undergoing training must first pass physician's examination and a certificate of the same must be kept on file at rescue station.

First Aid Supplies on Hand at Above Date

	Mine	On Hand	Wanted	Remarks
Stretchers				
Blankets				
Splints				
Bandage				
Cotton				
Gauze				
Spts. of Ammonia				

_____

FOREMAN

(8)

Digitized by Google

THE IRON COMPANY

ELECTRICAL DEPARTMENT

QUARTERLY INSPECTION REPORT

SURFACE— **Mine** .....

Head-Frame, Landing and Tunnel—

Condition of Signals and Telephone.....

Condition of Lighting.....

Condition of Cables and Hangers.....

.....

Are Armor and Sheath Properly Grounded?.....

UNDERGROUND—

Shaft Cables—Condition .....

When and by whom inspected through shaft .....

Levels	Haulage Track and Bonding	Trolley	Signals	Lighting

Main Pump House—

Cables .....Potheads .....

Switchboard .....Motors .....

Starting Apparatus .....

Are Motor Frames, Starters and Switchboard Frames Grounded? .....

Are Pyrene Extinguishers in Place?.....

.....

Sump and Winze Pumps .....

.....

Underground Hoists .....

.....

Scrapers and Loaders .....

.....

.....

Ventilating Fans—A.C. or D.C.....

Where Located .....

Condition of Motors .....

Condition of Starters and Switches.....

Are These Properly Protected and Fireproof?.....

.....

Miscellaneous .....

.....

Comments by Master Mechanic.....

.....

Date .....Inspection by .....

Approved .....Chief Electrician .....C. M. E.

Noted .....Safety Inspector .....Gen. Supt.

..... Gen. Mgr.

This report is to be made quarterly in triplicate, two copies with the Chief Mechanical Engineer's comments to be sent promptly to the Central Office.

Digitized by Google

1M-4-27-I.O.-G-5125. (909)

THE IRON CO.

MINING DEPARTMENT

SAFETY INSPECTION REPORT

No.....

Mine .....

Date .....

THE IRON COMPANY

MINING DEPARTMENT

Safety Inspection Report

.....No.....

..... MINE DATE.....

Surface—

1. What are conditions of roadways on Company's property over which workmen are obliged to travel to reach place of work?
2. Are such roadways properly lighted?
3. Are railway tracks used as roadways and cannot other ways be provided?
4. Are all open pits, caves, disused and abandoned shafts properly protected?

Change House—

1. Is dry lighted by kerosene lamps or electric lights?
2. Is dry sufficiently lighted?
3. Are accommodations ample for men employed at the mine?
4. What protection for safety from fire is provided?
5. Is fire protection in good order? 6. What are sanitary conditions?
7. What accommodations and appliances are provided for injured persons?
8. How many fire-fighting helmets are provided? And where kept?
9. Are the same kept in good order?
10. Are there men around the mine who understand the first care of injured men and the use of fire-fighting helmets?

Shafts—

1. Is protection at collar of shaft sufficient and in good order?
2. Is opening to shaft at timber tunnel properly protected and in good order?
3. Is protection at shaft stations sufficient and in good order?
4. Are there skip tenders and at what levels?
5. Is there a cage rider?
6. What tools are allowed with men riding in skip, cage or bucket?
7. Are projecting tools properly lashed to hoisting ropes?
8. How often are timbers in manways cleaned?
9. Are they in good condition?
10. Are working stations sufficiently lighted?
11. Are there passageways at all levels around hoisting compartment?

Digitized by Google

12. Are same in good condition?
13. Are there guides for the bucket?
14. What style of crosshead is used?
15. What clearance is provided on guides?
16. Is stopper securely fastened to hoisting rope at least seven feet above rim of bucket?
17. Are guides and crosshead kept in good condition?
18. Is there more than one outlet to surface?
19. Are there connections between levels other than the main shaft?
20. Is the second outlet kept in good condition?
21. Is condition of pipes, electric wires and conduits safe?
22. Are steam pipes covered or protected from accidental contact?
23. Is the general condition of the compartment through which men are hoisted safe for men as regards lagging, timber, guides, etc.?

Sinking—

(When more than one shaft is being sunk, separate report must be made for each.) The following questions apply to sinking new shafts and also deepening shafts:

1. In lowering is bucket stopped 15 feet above the bottom of shaft?
2. Is shaft suitably covered while sinking is going on?
3. Are only safety hooks used for bucket?
4. Are there ladders reaching to the bottom of the shaft while sinking?
5. State what kind of ladders and if in good condition?
6. Is bell rope within reach of men in bucket at bottom of shaft?

General Mining—

1. Is general condition of timbering or other means of support throughout the mine satisfactory?
2. Are mine maps clear and accurate for purpose of inspection?
3. Are all dangerous places fenced off?
4. Are proper danger signal boards displayed at all dangerous places?
5. Are candles or lamps left burning after shift?
6. Are sumps securely planked over?
7. In passageways, are roofs and walls securely lagged?
8. Are winzes and raises in direct line of drift?
9. Are winzes, raises and open stopes properly guarded?
10. Are ladderways in winzes and raises located in drifts properly protected by hatches?
11. Are all chutes in winzes and raises properly protected by gratings?
12. Is proper provision made for safety of men working at chutes?
13. Are the communications between contiguous mines in good condition?
14. What is the condition of ventilation in different parts of the mine?
15. Are sufficient dry closets maintained?
16. While the responsibility for the safety of the roof and walls in the individual places is upon the workman, are the same also inspected by superintendent, captain and shift bosses, and how often?
17. Are the rules for safety pillars on boundaries observed?
18. In approaching workings which are known to be flooded are proper precautions taken?
19. Complaints from workman—report if any?

Main and Sub-Levels—

1. Are levels and sub-levels properly ditched to prevent water from accumulating, making passage unsafe?
2. Are there any other conditions which might be dangerous for passageway for men?
3. Are tracks and switches in safe condition?
4. Is condition of wiring safe?
5. Is condition and arrangement of piping safe?
6. On haulage roads, are drifts properly lighted?
7. On all main drifts is there a manhole or refuge every 100 yards?
8. Are they kept clear?
9. Are the rules governing the employment of motor and brakeman carefully enforced?
10. Are the rules governing the operation of electric motors strictly enforced?

Explosives; Manner of Handling—

1. Are explosives stored on surface and are the company's rules strictly complied with?

Digitized by Google

2. Are caps stored on surface, and where?
3. How often are explosives taken into mine?
4. Are packages of explosives plainly marked, giving date and strength, also name and place of manufacture?
5. Is there more than 72 hours supply of explosives stored in one place in the mine?
6. Is the same stored 50 feet from any other supply of powder?
7. How is dynamite thawed? 8. Is the method employed safe?
9. Are conditions as to blasting complied with?
10. Are the rules posted in conspicuous places?
11. Do men in preparing dynamite for blasting always use skewers and cap crimpers?
12. Before blasting are the necessary warnings given?

Ladderways—

1. Do rungs of ladders exceed 12 inches part?
2. Are ladders placed 3 inches from wall of shaft or other openings?
3. Are there platforms for ladders at least every 24 feet?
4. Are there manholes for ladders?
5. Do ladders project at least 3 feet above sollars, or are hand rails provided?
6. Are any ladders inclined backwards from the vertical?
7. Are rungs made of wood and iron?
8. Is there a complete ladderway from the lowest workings to surface?
9. Is there any loose rock or timber left at the top of ladderways, where it might accidentally fall or be pushed into same?
10. Are ladders and ladderways kept in good condition?
11. How often inspected? 12. Are stairways kept in good condition?

MECHANICAL.

Hoisting –

1. Have printed rules, governing duties of hoisting been furnished to hoisting engineer and receipt taken for same?
2. Are the company's rules governing duties of hoisting engineers properly posted?
3. Are they maintained in good condition?
4. Is speed of hoisting and lowering men ever 1,000 feet per minute?
5. How often are machinery and safety appliances inspected?
6. Are cages, skips or buckets used for hoisting men, inspected daily?
7. Are the cages properly enclosed and protected?
8. Are signals in good order; is there a duplicate system of signals?
9. Is signal code posted in engine house and at each level?
10. Is moving machinery properly guarded?
11. Is hoisting plant equipped with an overwinding device?
12. Is the same in good working order?
13. Are safety devices tested once each month by the superintendent or captain and inspector jointly?
14. Are hoisting ropes running through engine house protected for safety of men?
15. Are unnecessary persons excluded from the engine and boiler houses?

Hoisting Ropes—

1. Are ropes inspected every 24 hours? 2. What is the present condition of rope?
3. How often is section of rope tested?
4. When rope is lowered to bottom are there two full turns left on drum?
5. Is the further end of rope secured by six clamps or bolts?

Surface—

1. Are sheave stands and sheaves in shaft houses easily accessible and arranged for the safety of the men whose duties require them to oil and repair the same?
2. Is the machinery and belting in shops properly protected for the safety of employes and others?
3. Is the fire pump hydrant equipment provided for fire protection, ample?

Digitized by Google

4. Is the quantity of fire hose provided, ample? 5. When last inspected?
6. What is condition of same?
7. Where are lubricating oils and grease stored?
8. Is storage place kept in safe condition?
9. Where are kerosene and inflammable oils stored?
10. Is storage place kept in safe condition?
11. Are hoisting ropes, guy wires and piping on surface properly protected?
12. Is protection provided for safety of employes and others during construction and repair work?

Boilers—

1. Are safety devices provided for boilers kept in good working condition?
2. Are general conditions in boiler house safe?
3. How often are boilers inspected?
4. Are recommendations promptly complied with?
5. Are all steam pipes covered or protected from accidental contact?
6. Is boiler room properly lighted?

Engine House—

1. What is condition of piping and general equipment as regards safety?
2. Is engine room properly lighted?
3. Is basement of engine house used for storage of materials?
4. Is the same arranged for safety of men?

Compressors—

1. Is moving machinery properly guarded?
2. What is condition of piping around compressor as regards safety?

Electric Engines and Dynamos—

1. Is moving machinery properly guarded?
2. Is switchboard railed off to prevent handling by outsiders?
3. Are all wires carefully strung to prevent accidental contact?

Pump Stations—

1. Is moving machinery properly protected? 2. Are electric wires safe?
3. Is station properly lighted?

Top Trams—

1. Is moving machinery properly protected? 2. Is wiring properly protected?
3. Are counterweights safe?
4. Are walks and hand rails provided on permanent trestles?
5. Can the conditions for safety of men be improved?

Crusher—

1. Are belts and shafting properly protected?
2. Are proper railings provided for all walks and openings?
3. Are electric wires properly protected?
4. Are stairs and ladders in safe condition?
5. Are all oiling places safely accessible?

Steam Shovel—

1. Is all moving machinery properly protected?
2. Are all gears covered?
3. Is shovel in good condition for the work being done?
4. Are runways and stands protected by railing?
5. Is proper care taken to prevent trestle legs from falling and injuring workmen?

General Applications—

1. Are accidents to persons and equipment reported promptly?
2. Are occurrences of fire, floods, extraordinary caves, and similar accidents, dangerous to life or health, reported promptly.
3. Do superintendents, captains and shift bosses, instruct employes as to their responsibility?
4. Is discipline strict or lax?
5. Are persons allowed in or around the mine except by permission?

Digitized by Google

WEEKLY HEAD FITTSMAN'S REPORT

Week Beginning _____

CAGES	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Condition of Rope Attachment						
Broken wires in rope						
General Condition						
Doors						
Gates						
Safety Dogs & Springs						
Wheels & Boxes						
Any broken wires at clips						
Miscellaneous						
Date of Change						

SKIPS	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
General Condition						
Rails						
Guides						
Wheels & Boxes						
Broken wires at clips						
Miscellaneous						
Date of Change						

SHEAVES

General Remarks

COUNTERWEIGHT

Condition

Date of Pipe Lubrication

REMARKS:

(11)

HOIST INSPECTOR'S REPORT

_____ Hoist Month _____ 19____

Date	Doe. Main Throttle close at proper time?	Does slow down device work?	Dist. from dumy mark to trip point of overwind in inches.	Time in secs. to set brake with wedge in.	Time in secs. to set brake with wedge out.	Are gate or chair signals alright?	Time of Skip Inspection.	Time of Cage Safety Dog Inspection.	Is brake travel alright with collar brake?	Do slack rope signals work?	Is operating controller alright?	Is control panel alright?	Does signal bell work	Does return bell work?	Signature.
1.															
2.															
3.															
4.															
5.															
6.															
7.															
8.															
9.															
10.															
11.															
12.															
13.															
14.															
15.															
16.															
17.															
18.															
19.															
20.															
21.															
22.															
23.															
24.															
25.															
26.															
27.															
28.															
29.															
30.															
31.															

(12)

Digitized by Google

THE -------- MINING COMPANY

SAFETY REPORT ON CAGES

Date _____

Date Tested	Name of Cage	Place Tested	By Whom	Cage Drop	Remarks

Mar. 35

(13)

THE _____ MINING COMPANY

_____, Michigan

WEEKLY REPORT OF LILLY HOIST CONTROLLERS

Date _____

PLACE	CONDITION
No. 4 Skip Hoist, South Drum	
No. 4 Skip Hoist, North Drum	
No. 4 Cage Hoist, South Drum	
No. 4 Cage Hoist, North Drum	
No. 5 Cage Hoist.	

Remarks:

_____
Chief Electrician

(14)

THE -------- MINING COMPANY
_____, Michigan

Daily) REPORT ON SKIPS, CAGES AND HOISTING CABLES
WEEKLY)

PLACE	CONDITION	DATE
No. 4 Shaft Skips		
No. 4 Shaft Cages		
No. 4 Shaft Skip Rope Shackles		
No. 4 Cage Rope Shackles		
No. 4 Shaft Skip Ropes		
No. 4 Shaft Cage Ropes		
No. 5 Shaft Cages		
No. 5 Shaft Cage Rope Shackles		
No. 5 Shaft Cage Rope		
No. 4 Crusher		
No. 4 Skip Dump		

_____
Foreman

_____
Foreman

(15)

THE _____ MINING COMPANY

_____, Michigan

WEEKLY REPORT ON BLASTING LINES AND CONTROL

NO. 4 SHAFT	CONDITION	DATE
24th Level		
25th Level		
26th Level		
27th Level		
28th Level		

_____
Chief Electrician

(16)

THE _____ MINING COMPANY

_____ Mine

The following is a report covering the handling of timber at the _____ Mine:

23rd Level Foot Side:

No. 2 Raise - Timber handled with timber cradle. Timber hoist is at top of raise on the 8th sub.

Nos. 4, 5½, 7, 8½, 10 and 11-3/4 Raises - Timber handled with timber cradle, timber hoists at the bottom of raises.

23rd Level North Crosscut:

Nos. 21, 23, and 24½ Raises - Timber handled with timber cradles. Timber hoists in 21 and 23 raises are on the 7th sub, and in 24½ raise, the timber hoist is on the 10th sub.

24th Level No. 1 West Drift:

No. 25½ Raise - Timber handled with timber cradle. We use two timber hoists in this raise, one hoist at the bottom of raise and one on the 7th sub.

Nos. 17, 20, 21½, 22½ and 24 Raises - Timber handled with timber cradle. Timber hoists at the bottom of raises.

28th Level No. 1 West Drift:

No. 3 Raise - Timber handled with timber cradle. Timber hoist at the bottom of raise.

We have a total of 17 timber cradles in use at the present time. Our practice is that wherever we are hoisting timber, we use a timber cradle. There is only one place in the mine where timber is being handled without a timber cradle. This is on the 23rd level north crosscut, No. 27 raise. The timber for this place is handled in 24½ raise by timber cradle to the 8th sub, and carried over to the 27th raise, then hoisted with slusher hoist from the 8th to the top of the raise. There is only one gang of miners working in this place and it is not considered necessary to use a timber cradle.

All four of our timber hoists have been turned around so that the rope runs under the drum instead of over the drum, and they will be guarded as soon as possible.

_____, Safety Engineer.

(17)

Digitized by Google

REPORT ON SAFETY BELTS

April 2, 1930.

The following is a report on the results of the tests made on the safety belts. Sixteen belts were tested on the above date, and one out of this number failed to stand the test.

Belt No.	Size of Hemp Rope	Remarks
1	5/4"	O.K.
2	"	"
3	"	"
4	"	"
5	"	"
6	"	"
7	"	Belt Broke in Center.
8	"	"
9	"	"
10	"	"
11	"	"
12	"	"
13	"	"
14	"	"
15	"	"
16	"	"

Note: A new belt was put in place of Number 7, numbered the same.

LOCATION OF BELTS

Nos. 1 and 2	Blacksmith Shop
Nos. 3 and 4	Carpenter Shop
Nos. 5, 6, 7, 8	23rd Level No. Crossout
Nos. 9, 10, 11, 12, 13	24th, 25th and 28th Levels
Nos. 14, 15, 16, 17	23rd Level Foot Side
Nos. 18, 19	In warehouse on stock

These belts were all tested on April 2, 1930, by dropping them six feet with a weight of 120 lbs. All belts were oiled before they were put back in service.

_____, Safety Engineer.

(18)

THE _____ MINING COMPANY

_____ MINE

Shift Bosses Daily Underground Safety Report DATE _____ SHIFT _____

LEVEL	CONT. NO.	WORKING PLACE	CLEANLINESS	SAFETY	REMARKS

SHIFT BOSSES DAILY UNDERGROUND SAFETY REPORT

At the end of each shift, each boss is required to make _____ out this report, showing the condition of each place over which _____ he has charge. It must be signed by the boss making it out and _____ also by the shift boss going on shift.

CONTENTS NOTED:

_____ BOSS IN CHARGE OF OPPOSITE SHIFT

_____ SHIFT BOSS IN CHARGE

(20)

Digitized by Google

THE _____ MINING COMPANY
FIRE EXTINGUISHER INSPECTION
March 21, 1930

	1 Qt. C. T.	2½ Gal S.A.	2½ Gal. F.T.	Remarks	Date Refilled	Date of Inspection
Doctor's office--near entrance	1			O.K.	7/19/29	3/17/30
Mine office--foot of stairs	1			"	11/15/29	3/17/30
Mine office--head of stairs	1			"	12/23/29	3/17/30
Laboratory--near entrance	1			"	11/15/29	3/17/30
#4 Captain's Dry	1			"	11/15/29	3/17/30
#4 Riverside Dry--near door			2	"	2/21/30	3/18/30
Warehouse--foot of stairs			1	"	6/14/29	3/17/30
Warehouse--near office	1			"	10/15/29	3/17/30
Carpenter shop--near tool room	1			"	5/17/29	3/17/30
Carpenter shop--near tool room			1	"	11/30/29	3/17/30
Electric shop--on door	1			"	11/15/29	3/17/30
Machine shop--near tool room	1			"	12/23/29	3/17/30
Blacksmith shop--near office	1			"	3/17/30	3/17/30
Watersupply--near door	2			"	9/18/20	3/18/30
#4 Engine House--near switchboard	2			"	9/19/28	3/17/30
#4 Engine House--center of east wall	2			"	8/20/29	3/17/30
#4 Engine Hoist--near ore hoist	2			"	6/14/29	3/17/30
#4 Engine House--center of basement	3			"	7/18/29	3/17/30
#4 Engine House--near cell of structure	2			"	11/15/29	3/17/30
----- Boiler Room--head of stairs	1			"	11/15/29	3/17/30
----- Engine House--on door	2			"	7/19/29	3/17/30
Club House--main stairway	1			"	7/19/29	3/17/30
Clubhouse--basement stairway	1			"	7/19/29	3/17/30
#4 Shaft House--motormen's room	1			"	11/29/29	3/18/30

	1 Qt. C.T.	2½ Gal S.A.	2½ Gal F.T.	Remarks	Refilled	Inspection
#4 Shaft House--near crusher control	1			O.K.	11/29/29	3/18/30
#2 Truck	1			"	1/27/30	3/18/30
4th Level #2 Shaft Pump Room	2			"	6/27/29	3/19/30
22nd Level Fan	2			"	1/23/30	3/19/30
22nd Level Powder House	2			Taken Out.		3/10/30
23rd Level Machine Shop	2			O.K.	2/22/30	3/19/30
23rd Level Pump House	1 Gal. C.T.			"	6/12/29	3/19/30
23rd Level Hoist Room	1			"	1/23/30	3/19/30
23rd Level Pump Room	2			"	10/16/29	3/19/30
23rd Level Fuse House	1			"	8/8/29	3/19/30
23rd Level Powder House	1			"	8/8/29	3/19/30
24th Level Sub Station	1			"	3/16/29	3/19/30
24th Level Powder House	1			"	6/15/29	3/19/30
Welding Torch and Tank Cart	1			"	2/21/30	3/19/30
#4 Engine House--center of east wall	1 Gal. C.T.			"	6/12/29	2/19/30

C.T. - Carbon Tetrachloride
S.A. - Soda Acid
F.T. - Foamite

Digitized by Google